

Hiding the Losses

Fiscal Transparency and the Performance of Government Portfolios of Financial Assets

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Abstract:

The widespread reliance on *gross* government debt and deficit/surplus as indicators of fiscal performance has too often neglected the role played by other important parts of a government's balance sheet including their portfolios of financial assets. Partial measures of net worth leaves an important gap in the empirical literature on financial performance and fiscal transparency. The purpose of this paper is to examine the role played by equity investments and their performance in secondary markets. The results suggest that the performance of government equity portfolios correlates strongly with fiscal transparency to the extent that fully transparent governments are expected to generate around seven percent higher returns than fully opaque governments. We also find strong evidence of governments willingness to inject liquidity, via investing in equities, into other sectors of the economy during periods of financial crisis confirming governments role as an 'investor of last resort'.

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I. INTRODUCTION

Large scale public sector financial responses to the 2008 financial crisis underscored a need for higher quality and more comprehensive macroeconomic statistics to achieve better policy responses, especially for the public and financial sector.¹ More recently, the unprecedented deficit spending to finance a worldwide coronavirus lockdown, has again amplified the need for high levels of fiscal transparency. While gross debt and surplus/deficits tend to be the *de facto* ‘go to’ measures for assessing a government’s fiscal performance, the integrated relationship between these two concepts has become an area of greater scrutiny in the literature (Von Hagen and Wolf 2006; Campos, Jaimovich, and Panizza 2006; Weber 2012; Alt, Lassen, and Wehner 2012; Eurostat 2012; Seiferling 2013) with emphasis being placed on changes in net worth and government’s balance sheet (Blejer and Cheasty 1991; Easterly *et al* 1999; Milesi-Ferretti and Moriyama 2006). Some of these contributions have found a significant negative correlation between ‘stock-flow’ residuals that emerge from taking the difference between fiscal deficits, and first differenced stock of gross government debt, and fiscal transparency. However, past work from a sample of countries that disseminate fully integrated government financial data found evidence that this relationship does not exist when complete, rather than partial, stock-flow data are used (Seiferling 2013). This paper sheds some light on the missing link which reconciles these results by examining government holdings of financial assets in greater detail, examining the performance of government portfolios of financial assets and re-evaluating their relationship with fiscal transparency. The focal point of this decomposition is transactions in, and performance of, government equity portfolios with an emphasis on the realized

¹ See IMF Fiscal Transparency, Accountability, and Risk (2012).

and unrealized returns² from these portfolios³ where the majority of volatility in both acquisitions and holding gains/losses appears.

The results, from an unbalanced panel of 30 countries over the 1995–2020 period, suggest that government acquisition of equities is dependent on both fiscal performance indicators as well as movements in private markets. More specifically, governments tend to increase investment in equities when *i*) generating surplus fiscal balances; *ii*) increasing gross debt (likely to finance investments); *iii*) softening the impact of exogenous shocks to other sectors of the economy (financial crisis/pandemic); and *iv*) in response to their expected realized and unrealized returns on equity portfolios. The relationship between government’s equity portfolios and fiscal transparency appear, however, to be somewhat more complex than past results have suggested. While government investment in equities can take place for ‘policy lending’ purposes, some portfolios do generate significant profits and are not associated with specific domestic policies. Government who generate consistent surpluses, or with large sovereign wealth funds, for example, are able to generate higher returns from a well-structured equity portfolio than those expected from holding only debt securities. In order to better understand the relationship between stock-flow residuals and fiscal transparency requires, not only information regarding transaction in equities, but also the returns on these portfolios.

Section II of this paper will provide a brief overview of the existing literature on stock-flow adjustments and their usefulness in assessing the legitimacy or transparency of government’s financial accounts. Section III will examine the stock-flow residual at a more granular level and

² Throughout this paper, unrealized returns are defined as those whose prices are derived from movement in secondary markets and the asset is, either held by government at the end of an accounting period or has been sold by government during that period at market value.

³ Throughout this paper, the term ‘equity’ is consistent with the *Government Finance Statistics Manual 2014 (GFSM 2014)* ‘equity and investment fund shares.’

provide a discussion as well as some preliminary empirical insight into the components which make up this identity. Section IV will revisit the relationship between stock-flow residuals and fiscal transparency from a financial portfolio perspective. Section V will test for potential determinants of government acquisitions of, and unrealized returns on, shares and equities. Section VI discusses some limitations and section VII will discuss the results and conclude.

II. A BRIEF OVERVIEW OF THE LITERATURE

Since the mid-1990s a growing strand of literature has emerged emphasizing the importance of having comprehensive financial accounts when analysing fiscal performance. One important area of interest within this literature is ‘stock-flow residuals’ within (and between) countries over time which are often characterised as the difference between stocks (gross debt) and flows (deficits). The lessons which are still being learned from the 2008 crisis, and, more recently, the 2019 covid pandemic, combined with inconsistencies in reporting of financial information, continue to raise questions about the quality of financial decision making by government and their accountability to the public.⁴

Past literature has explored instances of ‘fiscal gimmickry,’ or ‘nonstructural adjustments,’ where government accounts are adjusted to achieve favourable results for highly visible indicators (deficits and gross debt), while hiding unpopular liabilities in less scrutinized areas within government balance sheets or removing them altogether (Easterly *et al* 1999; Milesi-Ferretti and Moriyama 2006; Koen and van den Noord 2005; Buti *et al* 2007; Alt, Lassen, and Wehner 2012; Irwin 2012). Some of these practices can be (borderline) legitimate by international accounting standards but tend to obfuscate true fiscal performance, especially where numerical benchmarks, or fiscal rules, are required to be met by law.

⁴ See Jerven (2013).

Although not the first to examine this phenomenon, Buti *et al* (2007) provide some additional insight by exploring the strategic use of stock-flow adjustments, decomposing them into three main components.⁵ From these components, the authors compose two measures of “hidden deficits.” The first is seen as a timing tool where cash and accrual accounting can be used strategically to manipulate the timing of accrual deficit increases. The second measure attempts to isolate government subsidies disguised as the acquisition of financial assets by separating ‘safe’ from potentially ‘unsafe’ assets.⁶ Their empirical findings for a sample of EU-25 countries over the 1994–2004 period suggest that governments, subject to fiscal rules (Maastricht), are more likely to use the sale of financial assets to finance deficits and/or decrease gross debt.

A general theme in this literature is that governments who are in close violation of a fiscal rule that comes with built in loopholes will likely take advantage them. In order to remove these strategic loopholes, wholistic fiscal rules should be created based on a balance sheet approach which emphasizes the role of changes in net worth (or net debt) rather than gross debt or deficits (Easterly 1999; Milesi-Ferretti and Moriyama 2006; Buti *et al* 2007). In this context, the availability of fully integrated financial information would provide a more comprehensive view of fiscal performance by decomposing the stocks and flows of financial assets and liabilities over time. The absence of reliable and comprehensive fiscal data in many countries, however, prevents any analysis or understanding of how governments manage public money. Moreover, the continued low levels of reporting of fully integrated financial information leaves governments able to continue using ‘loopholes’ which are built into flexible fiscal rules or benchmarks (Kopits 2001; Milesi-Ferretti and Moriyama 2006).

⁵ These are i) the difference between accrual recording of deficits and cash recording of gross debt (i.e., the exclusion of other accounts payable/receivable); ii) the difference between gross and net recording of debt (exclusion of financial assets from the former); and iii) valuation effects and statistical adjustments (foreign exchange movements, redemption effects, etc.).

⁶ ‘Safe’ assets include securities and equity investments of social security funds (which are generally assumed to be high quality) and ‘unsafe’ assets include loans and equity investments (outside of social security subsector).

Turning to government portfolios of financial asset, one of the first considerations will be the overall profitability/returns on these investments. While the motivation behind investment decisions will certainly differ between (as well as within) the public and private sector, realized and unrealized returns/losses on investments will play a significant role in the determination of economic health and financial sustainability. For public sector investments, all governments will likely take into account the social and political benefits, but will also consider the expected direct and indirect economic returns over the lifetime of the asset in question (Brixi and Irwin 2004). In cases where these investments are likely to generate losses over their lifetime, but still deemed a government priority, any differences between the amount government pays and the market value of these investments should be acknowledged as an expense to government, which would have an immediate and transparent impact on fiscal balances (see *GFSM 2014*). In short, where government's expect to lose money on any 'investment', that loss should be recognized straight away as an increase in the deficit and not absorbed over time through holding losses (which are often not reported to the public).

While past literature has considered the role of government net acquisition of financial assets, none of these have considered the role of returns on these portfolios and their relationship with fiscal transparency, especially in the case of equity and investment fund shares. This paper is the first to take advantage of the available information on realized and unrealized returns from government's equities portfolio to measure their profitability relative to benchmark indices like S&P 500.

III. DEBT AND DEFICITS: DECOMPOSING THE STOCK-FLOW RESIDUAL

“A large stock flow adjustment [SFA] that depends predominantly on the accumulation of assets quoted in the stock exchange by a government in surplus has a considerably different nature from a large positive SFA because of the increase in the share capital of distressed

public enterprises, a depreciation of national currency, because the government had to settle a large stock of spending arrears or simply because cash and accrual statistics do not match.

Which of the SFA components can then be used as strategic variables to disguise its deficits?"

-Buti *et al* 2007-

The challenge when answering this question is the limited information that exists regarding government portfolios of financial assets. This is especially important information when considering: *i*) the necessity of monitoring cash to ensure government liquidity (i.e. to offset liabilities with short term maturities and pay government bills), especially in the case of emerging/developing economies, *ii*) accountability for the use of additional funds from surplus generating governments (i.e. well managed sovereign wealth funds); and *iii*) understanding governments use of financing as a mechanism by which they minimize/absorb some of the damage from exogenous shocks to other sectors of the economy (bank bailouts, pandemic lockdowns). The returns, or holding gains/losses from government investments provides important information on valuation changes from movement in secondary markets and changes in foreign exchange rates.

To get a better understanding of the substantive differences that result from having partially (no holdings gains/losses, no financial assets) vs fully integrated financial data Figure 1 shows the relationship between net lending/borrowing (surplus/deficit) and changes in gross debt for a sample of 57 general governments (central, state,⁷ and local) over the 1995–2020 period. Where observations do not fall on the imposed line, changes in gross debt and deficits differ and stock flow residuals will be non-zero. The prevalence of observations appearing in quadrants I and III (red markers) also suggest that general governments can run surpluses while increasing gross debt (quadrant I) and run a deficit

⁷ Where applicable.

while paying off gross debt (quadrant III). The downside to this partial measure is well expressed in both the prevalence of observations falling off the 45 degree line across all quadrants in Figure 1.

[FIGURE 1 HERE]

As noted in the opening quote of this section—this residual (distance from the 45 degree line) has too many meanings to be meaningful and requires further investigation. Fortunately, a significant proportion of this residual can be explained by two missing components: transactions in financial assets and other economic flows.⁸ Figure 2 shows the relationship between fiscal flows and changes in government net financial worth for the same sample of countries/years in Figure 1.

[FIGURE 2 HERE]

Comparing Figure 2 with Figure 1 suggests that incorporating information on government transactions in financial assets and other economic flows significantly expands our understanding of fiscal performance by focusing on changes in net worth rather than government surplus/deficit. The extent of realignment between observations in Figure 2 and Figure 1 also suggests that the magnitude of these two ‘missing links’ is not trivial. It is encouraging that not all observations fall exactly on the imposed line – there are a variety of reasons for stocks and flows to differ marginally (timing differences, rounding, statistical discrepancies).⁹

⁸ See Appendix I. We assume that liabilities in the form of derivatives are zero for general government and they incur no liabilities in shares and equity $\sum_{i=7}^8 \tilde{x}_{it}^L = 0$.

⁹ Where all stock and flow is perfectly integrated in practice, this would raise questions about forced residuals and, therefore, the economic interpretation of fiscal flows.

Looking more closely at the composition of transactions in financial assets (the largest missing component) in advanced and emerging/developing countries, we can see a notable difference between the two groups of countries shown in Figure 3. Unsurprisingly, the majority of developing and emerging economy government hold the majority of the financial assets in currency and deposits (cash in the bank) with more diversified portfolios appearing in advanced economies with equities featuring prominently (especially during private sector bailouts in 2008). Governments in advanced economies also tend to place greater emphasis on extending loans and purchasing equity in temporarily insolvent firms during financial crisis than emerging market governments.

[FIGURE 3 HERE]

IV. FINANCIAL PORTFOLIOS AND FISCAL TRANSPARENCY

Results from past literature has supported findings that a significant relationship does exist between partial stock-flow residuals and fiscal transparency (Von Hagen and Wolf 2006; Weber 2012), however, this relationship becomes statistically insignificant once stock-flow residuals are measured using fully integrated stock-flow data (Seiferling 2013). These findings, along with the discussion in section III, suggest the need for a more comprehensive and granular approach to the relationship between government financial investments and fiscal transparency. Before doing this, it is necessary to consider the objectives of government when forming their choice financial portfolios.

The Portfolio Choice of Government

Unlike actors in the private sector, public sector policymakers are likely to make financial decisions based not only on profit maximization. The financial portfolio of government will likely also take into account social welfare and political considerations that come with investments in state owned enterprises, even if these carry greater risk and/or lower expected returns than those of a benchmark

market index such as the S&P 500. Governments can also use the acquisition of financial assets to soften the blow of exogenous macroeconomic shocks to other sectors of the economy and/or to restore market confidence during economic downturns.

There are also different motivations for holding specific financial instruments within a government's portfolio. In the case of cash and deposits, for example, these are required to be held for liquidity purposes (paying staff, bills, interest, etc) therefore would generally not be considered as a potential candidate for financial gimmickry.¹⁰ Debt securities (bonds, t-bills) are also likely to be relatively free from policy lending as these are (in most cases) considered to be safe and low risk financial assets.¹¹ Other accounts receivable (trade credits and advances, unpaid taxes, dividends, purchase/sale of securities, rent, wages and salaries, social contributions, social benefits, and similar items due to be received) are quite heterogeneous and an unlikely area for policy lending to occur as these are bills from previous transactions which are due to government. This leaves two financial instruments (loans and equity) as potential candidates. Both of these financial instruments can be used to prop up state-owned enterprises or fulfil unprofitable promises of 'investor/lender of last resort.' Given the relative magnitude of transactions in equities and the fact that holding gains on loans will be zero, we can focus our attention on the former.

Government Equity Portfolios

In cases where investment in equities produce consistent, or average, non-negative returns over time, they will not need government intervention to remain solvent - they do not impose a direct cost on

¹⁰ Interest would accrue on deposits, but this is likely to be very small.

¹¹ In the case of debt securities, these generally have low risk positive rate of return, and are purchased from foreign governments (not domestic policy related). As pointed out by a colleague, this neglects realistic cases where social security funds are obligated to purchase central government securities. Fortunately, such transactions would be consolidated out in *GFSY* general government data. Derivatives are also not likely to have any positive externalities for domestic politics.

taxpayers. In cases where financial investments produce consistently negative returns, these should realistically be recorded as a government expense (policy lending) which will have an immediate negative impact on fiscal balances. It is, however, difficult to identify whether capital injections contain implicit subsidies for specific financial investments (see Brixi and Irwin 2004),¹² especially when limited to low frequency macro-level data. As noted in Buti *et al* (2007), “ultimately, one would have to distinguish loans granted by government according to beneficiaries’ rating, and the specific conditions of each loan.” The same would hold true in the case of equities where “the purchase of blue-chip shares by social security investing its surpluses is not of the same nature of an injection in the share capital of a loss-making public enterprise by central government.”¹³ Unfortunately, the public availability of high frequency micro level data on government financial assets is scarce. It is, however, possible to explore the variance in financial portfolios (by instrument) across countries and over time using the IMF Government Finance Statistics Yearbook (*GFSY*) database. This takes the analysis a step further from past approaches (Buti *et al*, 2007 and Alt *et al*, 2014) by incorporating information on the performance of financial assets, examining their average aggregate profitability. Characterizing the returns of government equity investments as:

$$\tau = \tau^R + \tau^U$$

where τ^R and τ^U are measured as interest/dividend revenue (realized returns), and holding gains (unrealized returns) as a percentage of the stock of government equity portfolios. Measuring the effective realized and unrealized returns for government’s portfolio of shares and equity is a relatively straightforward exercise:

$$\tau^R = \frac{DR}{\bar{x}_E}$$

and,

¹² One step to improve transparency mentioned in Brixi and Irwin (2004) would be the publication of individual contracts which could include any equity acquisitions.

¹³ In relation to shares, the distinction between good and bad assets could be attempted by separating the shares which are quoted in the stock exchange and the non-quoted shares, in particular in enterprises which are controlled by government.

$$\tau^U = \Delta h g_E / \bar{x}_E$$

where DR is total dividend revenue over period t and \bar{x}_E is the stock of government equity portfolios. Figure 4 shows average unrealized returns (which include movements in foreign exchange rates where applicable)¹⁴ for general governments and social security subsectors relative to average private returns on equity (S&P 500).

[FIGURE 4 HERE]

Trends in these averages suggest that governments seem to be relatively conservative in their choice equity portfolio compared with those of the private sector (lower volatility in unrealized returns) and, social security fund equity portfolios tend to mimic private market returns to a greater degree than general government portfolios. Combining these results with those in Figure 3 suggests that governments tend to favor the acquisition of equities during market downturns. This preliminary finding supports the idea that government are willing to act as a countercyclical measure to economic downturns and/or mechanism to temporarily ensure solvency of institutional units in other sectors.

V. DATA, ESTIMATION AND RESULTS

All government finance data was sourced from the IMF's *GFSY*. Additional data for macroeconomic indicators, S&P 500 average returns, and financial crisis, were sourced from IMF World Economic Outlook, Macrotrends, and Castro, Nguyen and Wood (2022), respectively.

The size and performance of government equity portfolios can be considered as two interrelated equations. The first is concerned with factors which will motivate government investment in equity

¹⁴ This would only apply to assets and liabilities held in foreign currencies.

(size), including expected returns (realized and unrealized) along with other important factors like government's availability of surplus funds, incurrence of new debt and financial crises:

$$\kappa_{jt} = \alpha^U \tau_{j,t}^U + \alpha^R \tau_{j,t}^R + \delta(nlb_{jt}) + \eta(chdebt_{jt}) + \rho(crisis_j) + \beta(lngdp_{jt}) + \varepsilon_{jt} \quad (1a)$$

Where:

κ_{jt} is general government j 's net transactions in equity over period t and $t+1$

τ_{jt}^R is the effective realized returns on the stock of equities at time t in country j

τ_{jt}^U is the effective unrealized returns on the stock of equities at time t in country j

nlb_{jt} is general government j 's net lending borrowing (surplus/deficit) in year t as a percent of GDP

$chdebt_{jt}$ is general government j 's change in gross debt between year t and year $t-1$ as a percent of GDP

$crisis_{jt}$ measures the binary existence of a banking crisis in country j at time t (from Castro, Nguyen and Wood, 2022),

$lngdp_{jt}$ is the natural log of GDP per capita in country j at time t

and, $(\lambda, \alpha^U, \alpha^R, \delta, \eta, \rho, \beta)$ are unknown parameter to be estimated.

In equation (1a) realized and unrealized returns are separated as the former would provide additional revenues/liquidity with which the government could re-invest, while the latter does not provide any additional liquidity (but does increase government net worth). The logic of this specification is relatively straightforward: governments, i) acquisition/sale of equities can be a good investment for surplus generating countries ($\delta > 0$), ii) debt is a tempting alternative to increasing taxation for deficit generating countries for countries who want to invest in equities ($\eta > 0$) which, iii) can be used to soften the impact of exogenous shocks on other sectors in the case of a banking crisis ($\rho > 0$), or, act as a countercyclical reaction to general downturn in private markets ($\alpha^U < 0$). Lastly, as

noted above, realized returns provide additional revenue/liquidity for governments expand their equity portfolio ($\alpha^R > 0$).

An initial inspection of equation (1a) may raise concerns about an endogeneity problem where fiscal surpluses/deficits (nfb) predicts changes in gross debt ($chdebt$). Looking back at Figure 1, it should be clear that this is not the case – surpluses are not necessarily used to pay down debt and changes in debt are not systematically attributable to fiscal deficits.

The second specification considers factors which determine the unrealized returns on government equity portfolios which we benchmark against average private market returns (S&P 500). We also consider the possibility that less transparent governments may generate lower returns from opaque investments with questionable profitability:

$$\tau_{jt}^u = \theta \tau_{j,t-1}^u + \alpha_M \tau_{jt}^M + \gamma trnsp_j + v_{jt} \quad (1b)$$

Where:

τ_{jt}^u is the effective unrealized returns on the stock of equities at time t in country j

τ_t^M measures the volatility and magnitude of private market returns (year on year changes in the S&P 500 index between time t and $t+1$)

$trnsp_j$ measures fiscal transparency in country j using IMF ROSC and International Budget Partnership Open Budget Index data,

and, θ, α_M, γ are unknown parameters to be estimated.

The logic behind equation (1b) is fairly straightforward: the performance of government equity portfolios to depend on overall market conditions/sentiment (S&P 500); the extent to which government portfolios do not mimic those in the private market may be partially attributable to how transparent that government is about their equity portfolios. Where governments generate lower returns from opaque investments we should expect that this is reflected in $\gamma > 0$.

Equations (1a) and (1b) are estimated using a random intercept model where $\varepsilon_{jt} = \zeta_j + \epsilon_{jt}$ and $v_{jt} = \vartheta_j + \omega_{jt}$, where $[\zeta_j, \vartheta_j]$ are time constant (permanent) error terms which vary across countries and $[\epsilon_{jt}, \omega_{jt}]$ are transitory across time and countries. The consistency of parameter estimates from this GLS estimated specification, relative to a fixed effects approach, are validated using a Hausman-test.¹⁵ Results for (1b) and for an unbalanced panel of 30 countries are shown respectively below with bootstrapped standard errors in parenthesis.

[TABLE 1 HERE]

As expected, returns on government equity portfolios (eq. 1b) are significantly associated with private market returns on equities. From the sample of 30 countries in column 2 of Table 1, government equity portfolios should expect a 0.7 percent higher returns given a ten point increase in their OBI score. Figure 5 plots this predicted relationship for equity returns as a function of fiscal transparency (general government and social security funds).

[FIGURE 5 HERE]

These results suggest that relatively transparent governments tend to hold significantly more profitable equity portfolios when comparing fully transparent with fully opaque governments.

With respect to transactions in equities, results for (1a) from an unbalanced panel of 30 countries are shown respectively below with bootstrapped standard errors in parenthesis.

[TABLE 2 HERE]

¹⁵ See Rabe-Hesketh and Skrondal (2005).

As expected, the key drivers of government net acquisitions of equities are fiscal balances (surplus generating countries are more likely to acquire equities), changes in gross debt, and exogenous shocks to other sectors (banking crisis). Realized returns (divident receipts) appear to play a minimal role in government's acquisition of equities with the consistently negative coefficient on unrealized returns potentially signifying a government's willingness to invest in equities during market downturns.

Because $\kappa = f_{\kappa}(\tau)$ and $\tau^u = f_{\tau}(\tau^M, trnsp)$, we assume that the effects of fiscal transparency and market volatility on government net acquisitions of equities can be imputed into (1b) into (1a).¹⁶ We use estimates for what market returns would look like: i) holding fiscal transparency constant and varying market returns $f_{\tau}(\tau_{jt}^M, \overline{trnsp})$, and, ii) holding market volatility constant while varying fiscal transparency $f_{\tau}(\overline{\tau_{jt}^M}, trnsp)$. Plugging these estimates for f_{τ} into f_{κ} via $\hat{\tau}^u$ captures the second order effect of fiscal transparency on government acquisition of equities in the first case (\overline{trnsp}), and captures the second order effects of private market volatility in the second case ($\overline{\tau_{jt}^M}$).

The predicted first order effects of a banking crisis and second order effects of private market fluctuations in equity prices on net acquisitions of general government equities from equation (1b) is shown in Figure 6.

[FIGURE 6 HERE]

The dashed lines show the predicted net acquisition of government equities during a financial crisis, while the solid lines show predicted net equisition of government equities during normal times.

¹⁶ This is imperfect for several reasons including the assumption that: $v_{Ejt} = 0 \rightarrow ((1b) \text{ is perfectly specified (which it isn't) and, that the parameter estimates in (1b) are known, or, estimated without error. Where 1b is not perfectly specified, this approach assumes that the residuals from equation (1a) and (1b) are uncorrelated } (corr(\varepsilon_{Ejt}, v_{Ejt}) = 0) \text{ and the parameter estimates in Table 3 and Table 4 are consistent.}$

Moving along the x-axis, we can see that government tends to favor equities as a means to prop up the economy during market downturns, which could work as a countercyclical mechanism to restore short-term confidence in the market. Moving along the y-axis, it appears that governments tend to be highly active in providing equity injections during financial crises to ensure the solvency of distressed firms and restore confidence in a post-crisis market.

The predicted second order effect of fiscal transparency on government's net acquisitions of equities is shown in Figure 7. While an interesting avenue for future exploration would be the second order multiplicative effects of fiscal transparency and market returns on net acquisition of equities (are untransparent governments more likely to sell off financial assets during crisis), equation (1b) characterizes these as being additive and thus independent.¹⁷

[FIGURE 7 HERE]

This independence allows for a separation of the effects of market volatility and fiscal transparency. The second order relationship in Figure 7 is independent of changes in the equities market. During normal times, we would expect less transparent governments to acquire relatively larger equity portfolios than more transparent ones (moving along the x-axis), which is consistent with past findings (Buti *et al* 2007; Alt *et al* 2014).¹⁸ Combining this with the findings from Figure 6, less transparent countries are expected to generate significantly lower average returns on larger equity portfolios suggesting that these may contain some degree of 'policy lending' or 'unsafe assets.'

¹⁷ Alternative specifications were run for unrealized returns including a multiplicative term with promising results, suggesting transparent governments are more reliable during downward macroeconomic periods. These results would require a larger sample size to validate.

¹⁸ Note that these contributions considered fiscal transparency as a first order determinant of net acquisition of government equities.

VI. LIMITATIONS

The most glaring limitation in this paper is data availability. Our sample is biased towards countries who are willing to voluntarily provide detailed public finance data to the IMF. This approach neglects governments who are most likely be exploiting their ability to ‘invest’ in financial assets which are, at their core, transfers to friends and relatives. The challenge here comes from availability of information. To remedy this would require those who gain the most to voluntarily provide data which would clearly show conspicuous irregularities (a topic beyond the scope of this paper). Although this truncated approach is certainly not optimal, it does not preclude some initial insight from the limited sample of countries in this paper. A greater emphasis on the transparency of fiscal data can help to create “a requirement to disclose information about some hidden borrowing and subsidies” and will help to increase public awareness of how government is investing surplus revenues or incurred liabilities (see Brixi and Irwin 2004). This may lead to greater public calls for higher levels of transparency on government portfolios of assets (along with gross debt).

A central theme in this paper has been that a key ingredient for achieving fiscal transparency is the reporting of a complete financial data which integrates stocks and flows (Seiferling 2013). It is important to note that the empirical analysis below is confined to a small subsample of relatively transparent countries who have made significant progress in the production of comprehensive public accounts data as well as fiscal transparency. This suboptimal truncated approach still gives a reasonable sample of 30 countries over the 1995-2020 period which provides some insight into how governments who are more transparent will systematically have higher quality portfolios of financial assets in terms of the expected returns on equity portfolios.

VII. CONCLUSION

The results in this paper are encouraging for resolving differences in past finding on the relationship between stock-flow residuals and fiscal transparency. Governments' acquisition of shares and equities can be used as a tool to generate material returns for surplus generating government, or to 'cushion' the impact of exogenous shocks to other sectors of the domestic economy, as well as hide expected losses from 'policy lending.' Unlike past contributions, this paper finds that government acquisition of equities on their own, are not indicative of fiscal gimmickry, as average returns over time of transparent governments tend to be relatively profitable investments. A more promising indicator of fiscal transparency appears to be the size of unrealized returns on government equity portfolios.

While comprehensive fiscal surveillance based on more complete financial statistics may help to reduce the incentives for data manipulations, the majority of countries either continue to report budget statements on a cash basis or, for those that report on an accrual basis, do not report sufficient data to compute fully integrated stocks and flows, especially for the general government sector. Of the 140 countries who reported government finance statistics in the 2020 *GFSY*, about 18 percent reported sufficient data to compute fully integrated stocks and flows. Given the increasing emphasis on fiscal transparency, the main objective of this paper is to help ensure that the next generation of international fiscal statistics is able to fully report and explain changes in balance sheets over time. In this respect, the results in this paper pave the way for a promising area of future research as increasing number of governments are pressured into providing more transparent financial accounts.

Appendix I: Integrating Stocks and Flows

The complete stock-flow adjustment is an accounting identity which recognizes the roles of financial assets and other economic flows (volume and valuation changes). Consistent with international standards,¹⁹ the relationship between partial and complete stock-flow residuals can be characterized in four accounting identities:

i) change in net financial worth of government:²⁰

$$\Delta NFW_t = \sum_{i=1}^8 (\tilde{x}_{it}^{FA} + \Delta val_{x_{it}^{FA}} + \Delta vol_{x_{it}^{FA}}) - \sum_{i=1}^8 (\tilde{x}_{it}^L + \Delta val_{x_{it}^L} + \Delta vol_{x_{it}^L}) \quad (1a)$$

ii) change in gross government debt:

$$\Delta D_t = \sum_{i=1}^6 (\tilde{x}_{it}^L + \Delta val_{x_{it}^L} + \Delta vol_{x_{it}^L}) \quad (1b)$$

iii) government surplus/deficit:²¹

$$\delta_t = \sum_{i=1}^8 (\tilde{x}_{it}^L - \tilde{x}_{it}^{FA}) \quad (1c)$$

iv) other economic flows (volume and valuation changes):

$$oef_t = \sum_{i=1}^8 [(\Delta val_{x_{it}^{FA}} + \Delta vol_{x_{it}^{FA}}) - (\Delta val_{x_{it}^L} + \Delta vol_{x_{it}^L})] \quad (1d)$$

Where financial assets and liabilities are classified into eight separate instruments (debt securities, loans, other accounts payable, currency and deposits, SDRs and insurance, pension and standardized guarantee schemes), and:

ΔD_t is the first differenced stock of gross government debt²² in period t .

δ_t is net lending/borrowing (deficit/surplus) in period t .

\tilde{x}_i^q represents transactions in instrument i during fiscal year t ($q=FA$ for financial assets) or ($q=L$ for liabilities)

¹⁹ *GFSM 2014*

²⁰ Note that this measure does not include nonfinancial assets which, in practice are very difficult to both identify and value properly. For an in-depth discussion, see Bova et al (2013).

²¹ This is from a ‘below-the-line’ perspective.

²² As defined in *GFSM 2014* and *PSDSG 2012*. This definition includes all liabilities excluding equity and investment fund shares and derivatives.

$\Delta val_{x_{i,t}}^q$ represents holding gains and/or losses or re-evaluations of an asset ($q=NFA, FA$) or liability ($q=L$) for instrument i at time t

$\Delta vol_{x_{i,t}}^q$ represents changes in the volume of an asset ($q=FA$) or liability ($q=L$) for instrument i that do not result from a transaction or from valuation change.

From equations (1b) and (1c), the first conventional measure of stock-flow residuals reduces to

$$\Delta D_t - \delta_t = \sum_{i=1}^6 (\Delta val_{x_{i,t}}^L + \Delta vol_{x_{i,t}}^L) - (\sum_{i=7}^8 \tilde{x}_{i,t}^L - \sum_{i=1}^8 \tilde{x}_{i,t}^{FA}) \quad (2a)$$

and the difference between changes in net financial worth and fiscal flows reduces to zero:

$$\begin{aligned} \Delta NFW_t - (\delta_t + oef_t) &= \sum_{i=1}^8 (\tilde{x}_{i,t}^{FA} + \Delta val_{x_{i,t}}^{FA} + \Delta vol_{x_{i,t}}^{FA}) - \sum_{i=1}^8 (\tilde{x}_{i,t}^L + \Delta val_{x_{i,t}}^L + \Delta vol_{x_{i,t}}^L) \\ &+ (\sum_{i=1}^8 \tilde{x}_{i,t}^L - \sum_{i=1}^8 \tilde{x}_{i,t}^{FA}) - \sum_{i=1}^8 [(\Delta val_{x_{i,t}}^{FA} + \Delta vol_{x_{i,t}}^{FA}) - (\Delta val_{x_{i,t}}^L + \Delta vol_{x_{i,t}}^L)] = 0 \end{aligned} \quad (2b)$$

Appendix II. Summary Statistics

Variable	Mean (s.d.)	min	max	Source
General Government change in Gross Debt	0.89 (5.53)	-16.56	51.33	IMF WEO
General Government Net Lending/Borrowing	-1.66 (4.32)	-6.46	18.64	IMF GFSY
GDP per capita (ln)	5.67 (1.74)	1.41	8.74	IMF WEO
Financial Crisis	0.13 (0.34)	0	1	Castro, Nguyen and Wood, 2022
General Government net acquisition of equities	0.20 (1.63)	-13.10	21.25	IMF GFSY
General Government unrealized return (equity)	0.04 (0.11)	-0.46	0.50	IMF GFSY
General Government realized return (dividends)	0.03 (0.03)	0.0002	0.19	IMF GFSY
Social Security net acquisition of equities	0.10 (0.47)	-1.04	8.02	IMF GFSY
Social Security unrealized return (equity)	-0.01 (0.32)	-3.9	0.99	IMF GFSY
Social Security realized return (dividends)	0.02 (0.08)	0	1.14	IMF GFSY
Δ S&P 500	0.10 (0.17)	-0.38	0.34	Macrotrends
Fiscal Transparency	0.45 (0.23)	0	0.95	OBI and IMF ROSC

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Tables:**Table 1. Unrealized Returns on Shares and Equity (1b)**

Dependant var: unrealized returns (τ^u)	General Government		Social Security Funds	
	baseline	With transparency	baseline	With transparency
market returns (τ^M)	0.15*** (0.05)	0.11 (0.07)	0.54*** (0.14)	0.48*** (0.13)
fiscal transparency (<i>transp</i>)		0.07** (0.03)		0.09 (0.09)
lagged unrealized returns ($\tau_{j,t-1}^u$)	0.09** (0.05)	0.15*** (0.05)	-0.08 (0.07)	-0.10 (0.07)
Constant	0.02 (0.01)	-0.02 (0.02)	-0.05 (0.02)	-0.10 (0.08)
Countries	41	30	31	20
Observations	748	376	507	290
Rsqr (within)	0.05	0.03	0.10	0.08
Rsqr (between)	0.35	0.51	0.10	0.01
Rsqr (overall)	0.05	0.05	0.09	0.07

*** - significant at $p < 0.01$; ** - significant at $p < 0.05$; * - significant at $p < 0.1$

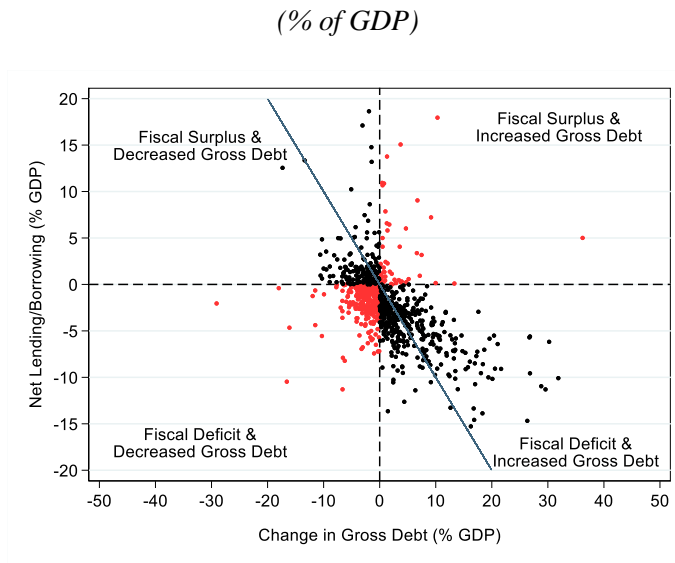
Table 2. Net Acquisition of Shares and Equity (1a)

Dependent variable: net acquisition of equities (κ_{jt})	General Government		Social Security Funds	
	baseline	With market returns	baseline	With market returns
net lending/borrowing (<i>nlb</i>)	0.21*** (0.07)	0.33*** (0.09)	0.01 (0.12)	0.21 (0.24)
changes in gross debt (<i>chdebt</i>)	0.08** (0.03)	0.13*** (0.04)	-0.002 (0.004)	0.001 (0.01)
GDP per capita (ln) (<i>lngdp</i>)	0.17*** (0.06)	0.10 (0.08)	0.01 (0.02)	0.002 (0.04)
financial crisis (<i>crisis</i>)	0.62 (.40)	0.57*** (0.21)	0.07 (0.07)	-0.02 (0.16)
realized returns (τ^R)		-1.64 (4.61)		-0.30 (0.92)
unrealized returns (τ^u)		-2.23* (1.35)		-0.01 (0.22)
Constant	-0.49 (0.29)	0.38 (0.41)	0.06 (0.13)	0.16 (0.32)
Countries	37	30	32	23
Observations	760	510	643	326
Rsqr (within)	0.07	0.14	0.002	0.02
Rsqr (between)	0.67	0.79	0.08	0.67
Rsqr (overall)	0.26	0.40	0.02	0.10

*** - significant at $p < 0.01$; ** - significant at $p < 0.05$; * - significant at $p < 0.1$

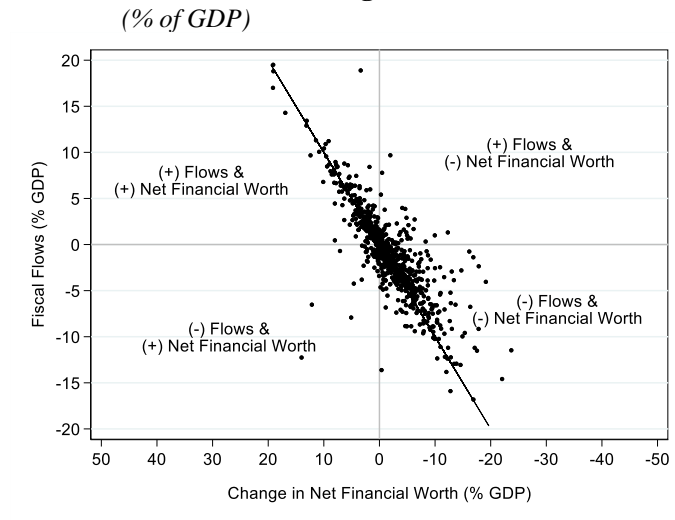
Figures:

Figure 1. General Fiscal Balances and Changes in Gross Debt



Source: IMF *GFSY (1995–2020)*

Figure 2. General Government Flows* and Changes in Net Financial Worth**



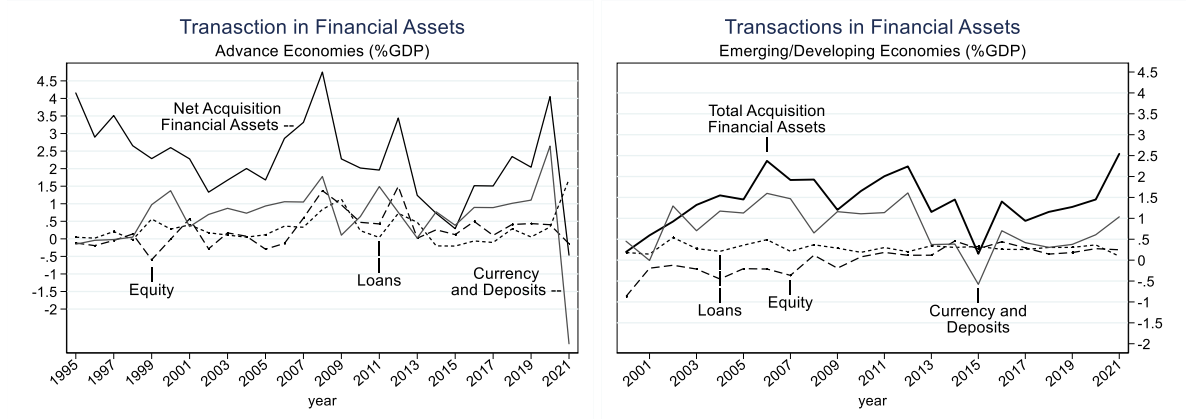
Source: IMF *GFSY (1995–2020)*

* see equations (1c) and (1d) in Appendix I

** see equation (1a) Appendix I

Figure 3. Average Transactions in Selected Financial Assets

(Advanced and Emerging Economies)

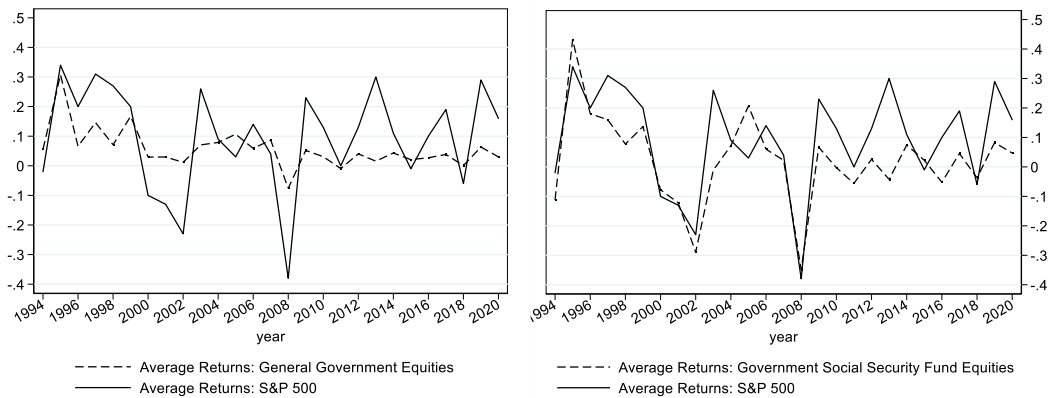


Source: IMF *GFSY* (1995–2021)

Figure 4. Average Returns on Government,²³ Social Security and Equity Investments

(a) General Government

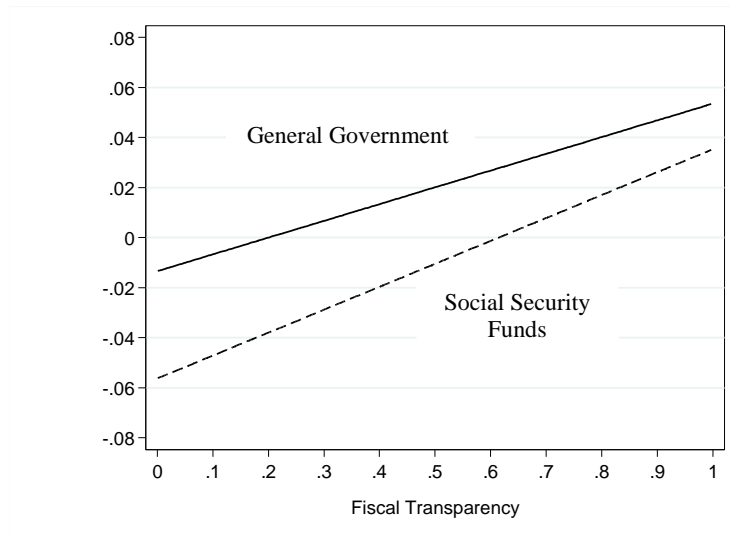
(b) Government Social Security Funds



Source: IMF *GFSY* (1994–2020) and S&P 500

²³ General government net of the social security subsector.

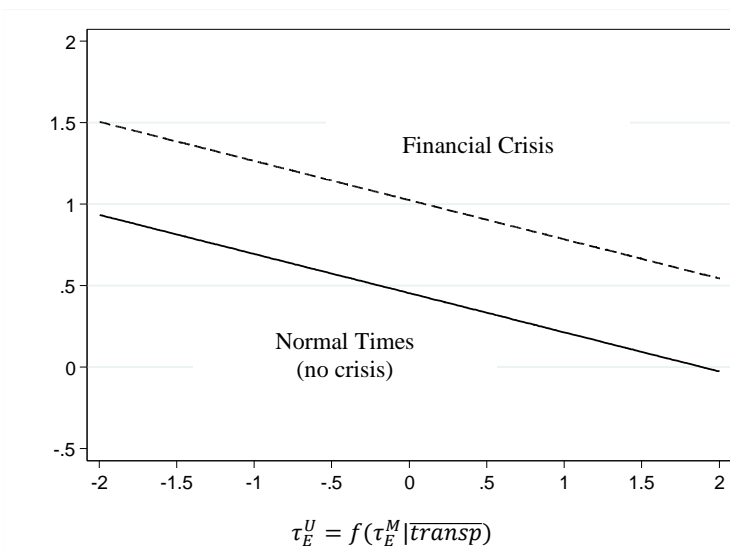
Figure 5. Predicted Unrealized Returns on Government Equity Portfolios and Fiscal Transparency



Source: Author's calculation (eq. 1b)

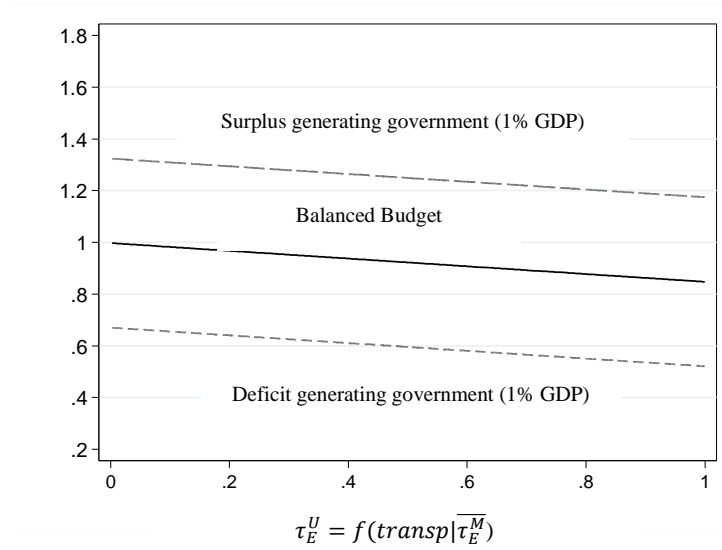
Figure 6. Government Acquisitions of Equities – Market Downturns and Bank Crises

(Total and Domestic)



Source: Author's calculations (eq. 1a and 1b)

Figure 7. Government Acquisitions of Equities and Fiscal Transparency



Source: Author's calculations (eq. 1a and 1b)